

Piceance Basin Hydrogen Sulfide Site Safety Plan

**South Grand Valley Field
Battlement Mesa Field
Rulison Field**



**Noble Energy, Inc.
Rifle, Colorado**

**Garfield County
Mesa County**

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1.0 Scope, Purpose, and Applicability

- 1.1 The Scope of the plan is to establish minimum requirements that will enhance safety and environmental Best- Practices while on a H2S location;
- 1.2 The Purpose of the plan is to implement detailed and well-planned strategies for engaging in operations on H2S locations, in the Piceance Basin, Parachute, CO.
- 1.3 The Applicability of the plan is intended to be evergreen throughout the execution of the Piceance Basin operations and will be modified, as needed, to provide safety guidance specific to changing operational plans. These modifications will be managed through NEI's Management of Change application.

2.0 Definitions

- 2.1 *H2S*: Hydrogen Sulfide
- 2.2 *H2S Location*; a location known or suspected of containing a concentration of H2S greater than 10 PPM.
- 2.3 *NEI*; Noble Energy, Inc. Piceance Basin
- 2.4 *PIC*; Person-in-Charge of job being conducted. Will be identified during pre-job planning
- 2.5 *SCBA*; Self contained breathing apparatus
- 2.6 *Well Servicing*; includes but is not limited to; drilling, swabbing, wireline, logging, perforating, stimulation, snubbing, hot-oiling, and coil tubing operations.

3.0 Prior to arriving to an H2S location

- 3.1 A listing of Piceance Basin H2S locations are identified in Appendix A
- 3.2 Completion of annual NEI Safety Orientation
 - 3.2.1 All individuals who will be working on-site at company operated locations shall have documented proof of their completion of Noble Energy annual Safety Orientation. Annual review is required.
- 3.3 Piceance Basin H2S Site Safety Plan
 - 3.3.1 All individuals who will be working or visiting on-site at company operated H2S location shall have documented proof of their

completion and review of the Piceance Basin H2S Site Safety Plan. Annual review is required.

3.4 Completion of H2S Training

- 3.4.1 NEI Employees and Contractor workers who will be working on-site of an H2S location shall have on person current certification of H2S Training.
- 3.4.2 Visitors, who do not meet the training requirements of 3.4.1 above are not allowed on an H2S location unless the following conditions are met:
 - Shall have approval from the Piceance Basin District Manager / Foremen.
 - Shall complete training requirements of 3.2 and 3.3 above.
 - Shall review H2S awareness pamphlet.
 - Must be accompanied by an NEI employee who meets 3.4.1 above.

4.0 Roles and Responsibilities

- 4.1 NEI employees / representatives - are responsible for ensuring that the provisions of this plan are fully implemented and will immediately Stop Work and report any unsafe act or unsafe condition identified due to an ongoing operation on a H2S location. The Stop Work shall be immediately reported to the Piceance Basin District Manager / Foreman; work will resume only at their direction.

5.0 Best Practices

5.1 Pre-Job Planning for H2S locations

- 5.1.1 Safety meetings (tailgate, pre-job briefing, etc...) shall be conducted on location prior to start of each day – each job and as directed by the Piceance Basin District Manager / Forman / Safety Representative. The safety meeting shall be documented and include the date, time, topic / description, and list of all attendees. Note; *all persons on location must participate / review the safety meeting documentation when arriving on location.*
- 5.1.2 A Job Risk Analysis (JRA) shall be performed prior to the start of each job and as directed by the Piceance Basin District Manager / Forman / Safety Representative. The JRA shall be documented and include the date, time, description, and list of all persons who participated / reviewed. Note; *all persons on location must conduct / review the JRA when arriving on location.*

- 5.1.3 Personal LEL / H2S monitors are required to be worn by each person on a H2S location. (Contractors are responsible for supplying their own personal monitors)
- 5.1.4 Continuous air monitoring shall be utilized during all well servicing operations on all H2S locations (see 6.1 below). Number of sensors and placement of sensors should be determined during the JRA process.
- 5.1.5 Signage - Signs stating “H2S May Be Present” shall be installed prominently at H2S facility entrances and across stairways leading up to any storage tanks equipped with thief hatches.
- 5.1.6 Wind Indicators - Orange windsocks shall be installed on H2S locations and be visible from anywhere on location.

6.0 Special Operations

- 6.1 Well Servicing Operations – prior to any well servicing, the H2S content shall be verified, recorded, and communicated during the safety meeting. Trained – qualified personnel checking the H2S content shall follow best industry practices for sampling H2S gas streams, including donning SCBAs and operating within the buddy system. If H2S is detected, a continuous air monitoring system shall be installed as indicated in 5.1.4 above.
 - 6.1.1 If H2S is detected in the atmosphere, the scheduled work will be delayed until the source of the atmospheric exposure is evaluated, removed and/or mitigated.
 - 6.1.2 If H2S is not detected in the atmosphere however is detected in the well stream greater than 10 ppm then each individual on location shall have a respirator readily available; emergency escape pack or SCBA. (Contractors are responsible for supplying their own respiratory protection)
 - 6.1.3 Any activation of an H2S alarm of 10 ppm (low alarm set-point on both personal and fixed monitors) requires immediate evacuation and a notification of the PIC. The source of the atmospheric exposure will be evaluated, removed and/or mitigated before work is resumed. See 7.1.1 below.
- 6.2 Tank Gauging Operations – Standard Operating Practices for daily tank gauging will be conducted by reading automatic electronic ground-level gauges. However, if and when manual tank gauging is required; prior to performing manual gauging, the H2S content within the tanks shall be verified, recorded, and communicated to NEI personnel. Trained – qualified personnel checking

the H2S content shall follow best industry practices for sampling H2S including donning SCBAs and operating within the buddy system.

- 6.2.1 If H2S is detected in the atmosphere then manual gauging will be delayed until the source of the atmospheric exposure is evaluated, removed and/or mitigated. See 7.1.1 below.
- 6.2.2 If H2S is not detected in the atmosphere however is detected within the tank greater than 10 ppm but less than 100 ppm, then each individual performing manual gauging shall, at a minimum, wear an emergency escape respirator and be prepared to don and immediately leave the area at the sound of an activated H2S alarm. (Contractors are responsible for supplying their own respiratory protection)
- 6.2.3 If H2S is not detected in the atmosphere however is detected within the tank and is greater 100 ppm, then individuals performing manual gauging shall don a SCBA and operate within the buddy system. *NEI employees will not perform manual gauging operations when the H2S content is above 100 ppm within the tank.*

6.3 Vacuum Truck Operations - prior to any loading from produced water storage tanks, the H2S content within the water storage tanks shall be verified, recorded, and communicated to the NEI lease operator who will schedule the water haul. Trained – qualified personnel checking the H2S content shall follow best industry practices for sampling H2S including donning SCBAs and the operating within the buddy system.

- 6.3.1 No produced water with H2S shall be loaded onto any trucks. If required, the water will be chemically treated to remove the H2S before being hauled.
- 6.3.2 All vacuum trucks loading water on any NEI location shall use a 20 foot length of vent hose from their scrubbers and vent to a safe location.

7.0 Emergency Response

7.1 An H2S alarm of 10ppm (low alarm set point on both personal and fixed monitors) requires immediate evacuation and a notification of the Piceance Basin District Manager / Foreman / Safety Representative. The area must be evaluated for cause and exposure mitigated before work is resumed.

- 7.1.1 If at anytime it is necessary for individuals to enter / work in an H2S environment above 10 PPM; only trained – qualified personnel following best industry practices for working in an H2S

environment will be allowed. Best industry practices include donning FRC, SCBAs and operating within the buddy system.

7.2 A trailer with supplied air, SCBAs and rescue equipment is on standby in the Piceance Basin; location will be identified during the safety meeting identified in 5.1.1 above.

7.3 Emergency contact list is located in Appendix B of this plan.

8.0 Record Keeping

8.1 Incident Reporting - All incidents involving contractor and employee injuries, company vehicles, or company equipment damages are to be reported, as soon as practical, to the EH&S Department by calling the Incident Reporting Answering Service at 1-888-NEI-SWAT (888-634-7928).

8.2 H₂S alarms of 10ppm (low alarm set point on both personal and fixed monitors) shall be reported through the company's Near-Miss reporting system.

Appendix A

Piceance Basin H2S Locations

Appendix B

Operations Emergency Contact Information

Appendix C

Drilling Emergency Contact Information